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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,707	04/18/2001	Bo Pi	07402-026001	8800

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EXAMINER

ROSE, KIESHA L

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 11/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/838,707

Applicant(s)

PI ET AL.

Examiner

Kiesha L. Rose

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 15 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

This Office Action is in response to the amendment filed 15 August 2002.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland (U.S. Patent 6,259,085) in view of Kim (U.S. Patent 5,510,285).

Holland discloses a back illuminated charge coupled device (Fig. 2a) that contains a n-type silicon substrate (18) with a first and second surface opposing each other, a polycrystalline transparent conductive bias layer (12) formed over the back surface and in electrical contact and formed internal to the substrate (18) by doping the substrate (18), an antireflection layer (20) formed on the electrode layer (12) an array of doped p-type gate regions (27) formed on the second surface and a circuit layer (11) formed over the second surface to provide a gate contact to and a readout circuit for each doped region. Holland discloses all of the limitations except for a grid of conducting wires. Whereas Kim discloses an image sensor (Fig. 7f) that contains an electrode with an aluminum grid conducting wires (OSM2) formed over the electrodes to form electrical connections to the electrodes and voltage source. Therefore it would

have been obvious to one of ordinary skill in the art at the time the invention was made to modify the charge coupled device of Holland by incorporating conducting wires to form electrical connections to the electrodes as taught by Kim. In regards to a bias voltage applied to the substrate, it would have been obvious to one having ordinary skill in the art at the time the invention was made to bias a bias layer to provide an current to the substrate to the doped gate regions.

Claims 19 and 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland (U.S. Patent 6,259,085) in view of Kim (U.S. Patent 5,510,285).

Holland discloses a back illuminated charge coupled device (Fig. 2a) that contains a n-type silicon substrate (18) with a first and second surface opposing each other, a polycrystalline transparent conductive bias electrode layer (12) formed over the back surface and in electrical contact and formed internal to the substrate (18) by doping the substrate (18), an antireflection layer (20) formed on electrode layer (12) an array of doped p-type gate regions (27) formed on the second surface and a circuit layer (11) formed over the second surface to provide a gate contact to and a readout circuit for each doped region. Holland discloses all of the limitations except for a grid of conducting wires. Whereas Kim discloses an image sensor (Fig. 7f) that contains an electrode with aluminum grid conducting wires (OSM2) formed over the electrodes to form electrical connections to the electrodes. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the charge coupled device of Holland by incorporating conducting wires to form electrical connections to the electrodes as taught by Kim. In regards to a bias voltage applied to

the photodiodes, it would have been obvious to one having ordinary skill in the art at the time the invention was made to bias a photodiodes to provide an electrical current through the device.

Claims 7-13 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland and Kim as applied to claim 1 above, and further in view of Cox et al. (U.S. Patent 5,381,013).

Holland and Kim disclose all of the limitations except for the device comprising a scintillation. Whereas Cox discloses an imaging system (Fig. 7) that contains a scintillation (402) formed in a scintillation crystal connected to the imaging system. The scintillation is formed on the imaging system to convert incoming x-rays to visible light. (Column 1, lines 52-54) Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the devices of Holland and Kim by incorporating a scintillation to convert incoming x-rays to visible light as taught by Cox. In regards to an array of scintillation, Cox discloses the claimed invention except for and array of scintillation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have an array of scintillation, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8 (1977).

Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland and Kim as applied to claim 19 above, and further in view of Cox et al. (U.S. Patent 5,381,013).

Holland and Kim disclose all of the limitations except for the device comprising a scintillation. Whereas Cox discloses an imaging system (Fig. 7) that contains a scintillation (402) formed in a scintillation crystal connected to the imaging system. The scintillation is formed on the imaging system to convert incoming x-rays to visible light. (Column 1, lines 52-54) Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the devices of Holland and Kim by incorporating a scintillation to convert incoming x-rays to visible light as taught by Cox. In regards to an array of scintillation, Cox discloses the claimed invention except for an array of scintillation. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have an array of scintillation, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8 (1977).

Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland, Kim and Cox as applied to claim 1 above, and further in view of Kasai et al. (U.S. Patent 5,262,633).

Holland, Kim and Cox disclose all of the limitations except for the antireflection layer to include a dielectric layer. Whereas Kasai discloses a wideband antireflection coating (Fig. 1) that contains a multilayer antireflection layer (30) comprised of dielectric layers (30a) having a specific refractive index. The antireflection layer comprises dielectric layers to enable detection of light at visible as well as infrared wavelengths. (Column 1, lines 11-13) Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the devices of Holland, Kim and

Cox by incorporating an antireflection layer comprising a dielectric layer to enable detection of light at visible and infrared wavelengths as taught by Kasai.

Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holland, Kim and Cox as applied to claim 19 above, and further in view of Kasai et al. (U.S. Patent 5,262,633).

Holland, Kim and Cox disclose all of the limitations except for the antireflection layer to include a dielectric layer. Whereas Kasai discloses a wideband antireflection coating (Fig. 1) that contains a multilayer antireflection layer (30) comprised of dielectric layers (30a) having a specific refractive index. The antireflection layer comprises dielectric layers to enable detection of light at visible as well as infrared wavelengths. (Column 1, lines 11-13) Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the devices of Holland, Kim and Cox by incorporating an antireflection layer comprising a dielectric layer to enable detection of light at visible and infrared wavelengths as taught by Kasai.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection. In regards to the applicant's argument about the Kim reference not disclosing a grid of conducting wires. The Kim reference discloses conducting wires OSM2 that are connected together which put them in electrical connection therefore they are a grid of wires. (Fig. 5, lines 5-7)


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiesha L. Rose whose telephone number is 703-605-4212. The examiner can normally be reached on M-F 8:30-6:00 off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

KR  
KLR  
October 30, 2002

  
AMIR ZARABIAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800